

WE CLAIM AS OUR INVENTION:

1. A high-frequency oscillator (HFO) ventilator comprising;
a first gas conduit having an opening adapted for gas connection with a patient's
airways and a bias gas flow inlet and a bias flow outlet disposed to define
therebetween a flow path for a bias gas within the first conduit;
an oscillator for inducing pressure oscillations in gas within the first conduit to
move said gas along a path intersecting the flow path for a bias gas
alternately into and out of the opening at a predetermined high-frequency;
~~and~~ said oscillator comprising ^{an arrangement} ~~means~~
for alternately introducing a volume of additional gas into and withdrawing at
least the volume of gas from the first gas conduit to induce the pressure
oscillations.
2. An HFO ventilator as claimed in claim 1 wherein said arrangement in the
oscillator ^{is disposed to introduce} ~~introduces~~ the volume of additional gas into the first gas conduit to intersect
the bias flow path at a location proximal the opening.
3. An HFO ventilator as claimed in claim 1 wherein said arrangement
comprises a second gas conduit arranged to introduce additional gas into the first gas
conduit in a direction toward the opening, a gas pulse generator connected to said
second conduit which introduces a train of gas pulses into said second conduit with
each pulse contain the volume of additional gas and being separated from a next pulse
in the pulse train by an inter-pulse interval and an extraction device which withdraws
gas from the first gas conduit at least in each inter-pulse interval.

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4. An HFO ventilator as claimed in claim 3 wherein the extraction device is in gaseous communication with the second gas conduit to withdraw the gas therethrough.

5. An HFO ventilator as claimed in claim 3 wherein the extraction device is in gaseous communication with the first gas conduit via a third gas conduit through which the extraction device withdraws the gas.

6. An HFO ventilator as claimed in claim 3 wherein the extraction device is in gaseous communication with an end of the first gas conduit distal the opening.

7. An HFO ventilator as claimed in claim 6 wherein the extraction device is further co-operatively in gaseous communication with the bias flow outlet to vent the withdrawn gas therethrough.

8. An HFO ventilator as claimed in claim 3 wherein the extraction device comprises a size variable gas holding volume in gaseous communication with the first gas conduit, the gas holding volume being defined at least in part by a wall section reciprocally moveable in timed relationship with the operation of the gas pulse generator to alternately increase the size of the gas holding volume to withdraw gas from the first conduit at least during said inter-pulse interval and to decrease the size of the gas holding volume to vent the withdrawn gas during said next gas pulse of the pulse train.

9. An HFO ventilator as claimed claim 1 wherein the oscillator introduces a volume of gas of between one and four milliliters per kilogram weight of a patient as said volume of additional gas.